

from David Lack's work on the significance of clutch-size in birds. Dawkins pays tribute to Lack for having clearly seen evolution as a matter of individual rather than species survival.

'The Selfish Gene' is a catchy title for a book which might more accurately have been called 'An Ethologist Discovers Evolution'. I recommend it as light and entertaining reading with some perceptive insight into the significance of animal behaviour seen from an evolutionary viewpoint, and as a caution to those conservationists who are over-preoccupied with the idea of what is good for the species.

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**Lichens as Pollution Monitors**, by DAVID L. HAWKSWORTH & FRANCIS ROSE. (Studies in Biology No. 66.) Edward Arnold, 25 Hill Street, London: iv + 60 pp., 17 figs, tables, 21.5 × 13.8 × 0.4 cm, £2.80, £1.40 paper covers, 1976.

This booklet is the sixty-sixth in the Institute of Biology's series of 'Studies in Biology'. The object of the series is to provide up-to-date coverage of conclusions from research, study methods, and proposals for practical work, on selected biological topics, for the use of teachers and students at school and university. The objectives of this particular publication are to summarize the effects of pollutants on lichens, to demonstrate how changes in lichen distribution can be used to ascertain levels and patterns of pollutants, and to draw attention to phenomena that can be observed and measured in the field.

The first four chapters describe the structure, reproduction, growth, and ecology, of lichens and the effect of pollutants and other factors (land management, climate, topography, and human disturbance) on their occurrence. Three further chapters explain the methods of mapping air pollution patterns from lichen studies, describe the effects of sulphur dioxide on the British lichen flora, and consider related matters—namely the results of legislation on sulphur dioxide levels, the effects of this pollutant on other plants and on Man, the consequences of lichen loss on invertebrates, and the place of lichen studies in environmental conservation. Two appendixes deal with the problem of lichen identification and with practical exercises in the mapping and listing of species as a basis for estimating pollution levels. Some references are listed within the text and there is a concluding bibliography.

To cover this field within a mere sixty pages of text and illustrations is no mean feat and has obviously restricted the Authors' scope for exploring interesting tributaries to the main stream. However, discussion of certain relatively important subjects—notably in the chapter on factors that affect the growth and distribution of lichens—has been pared down to the point of inadequacy. The effects of temperature, aspect, exposure, and the water-retaining capacity of substrates, receive scant attention, and the subject of drought surely merited more than the four sentences that it was allotted, in view of the significance previously attached to its inhibitory effect on lichen distribution in urban areas. The presentation of some material might also have been improved at the cost of a little additional space. For example, the reader should not have to search within the text to find the reasons why lichens are generally more sensitive than other plants to air pollution; in an introduction to the subject of this type the item deserves a clear explanation of the phenomenon in a section to itself.

Minor details aside, however, the authors have met their objectives remarkably well and, at the price, the booklet is a bargain.

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**Man and Environment: Crisis and the Strategy of Choice** (4th edn), by 'ROBERT ARVILL'. Penguin Books, Harmondsworth, Middlesex, England, and New York, N.Y. 10022: 432 pp., 13 figs, 18 × 11 × 1.6 cm, stiff paper covers, £1.25 or Can. \$5.25, 1976.

The fourth edition of this well-known primer by a well-known environmentalist writing under a now well-known pseudonym, is excellent value for the traveller's pocket though by no means light reading. Since the first edition was published in 1967, this work has increased in length by nearly one-third and almost tripled in price, while the illustrative material has been reduced very considerably; nevertheless the result is still satisfying.

There are, however, three main points which this Reviewer would hope the Author will bear in mind when preparing future editions: firstly, the book has been written largely for the British reader and with the practical purpose of creating in him or her a greater awareness of the environmental facts of life; to a foreigner it is interesting mostly by implication, which one hopes could be remedied for a wider readership.\* Secondly, the problem as 'Robert Arvill' evidently sees it is one of finding practical means of so protecting the biosphere that Man can enjoy it far into the future. This in fact means retarding the day of reckoning, as the Author intends to be practical while leaving aside the argument put up by the Chinese that 'If only you would accept to live as we do, there would be no population problem'. For I at least have always felt with horror that the actual threat to life on Earth is not only from the increase in our numbers but also from the profligacy of our living standards. Here one thinks for instance of the area of concrete currently required by a European or American compared with that expected by an Indian, so I wonder what exactly is behind the oddly persistent use of the term 'developing countries'?

To introduce my final point of what I hope to be constructive criticism, I must confess that reading this book brought to my mind persistently the image of a Hoopoe standing on a rotting tree-trunk. From what in life can we learn more than from a rotting tree? It will in due course turn to splendid manure, and meanwhile provide for many forms of saprophytic plant and animal life and offer the required nesting-place for beautiful seed-carrying and other birds. It is a microcosm of constant change and almost endless possibilities. Yet rotting wood is a waste as far as Man is concerned, and there is little doubt that the Author and his clientele will be loath to tolerate its existence.

One concluding thought: *Homo sapiens* agg. is surely the most evolved and the only responsible species living in the biosphere—at least to the extent that he may conform to what one cannot help presuming to have been the creator's wish—and so it would be particularly fascinating to have outlined what ought properly to be the liaison of Man with other forms of life which should surely be allowed to prosper and have their existence constantly made more secure and lasting than the reverse!

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\* The Author comments (*in litt.* 21 January 1977), and we agree, that in this connection 'the supplements [pp. 357–419] are of wide relevance.'—Ed.